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where a, b, c, etc., are determined from the equation by giving x and y the values obtained by experiment.

This process, now commonly found in text books on analytic geometry, has a definite application in experimental sciences and ought to be given if the time is available. It furnishes also a convenient setting for a discussion of continuity.

The last chapter of the book (31 pages) is a successful adaptation of the conceptions and equations of analytic geometry of three dimensions to the needs of the student in his first course in calculus without attempting to develop fully the subject of solid analytic geometry.

The authors have not seen fit to introduce any formal treatment of limits or continuity, although they define a tangent as the limiting position of a secant and suggest the notion of continuity in the chapter on "Empirical equations." It may be a debatable question how much of this should be given in a first course. Some teachers would be satisfied with the loose notions of elementary geometry while others would demand the precise ϵ, δ definitions, but it does seem that theories so involved in analytic geometry should be formally mentioned, and an attempt made to give to the student conceptions as accurate as his ability to understand permits.

On pages 53–56 the authors discuss the "Perpendicular distance to a given point from a given line." The discussion is based upon the unnecessary Hesse normal form of the equation of the straight line. Professor Maxime Bôcher, in his *Plane Analytic Geometry* (New York, 1915), first obtains the formula on pages 38 and 39; and on page 43 he sets up the Hesse normal form in fine print. In this MONTHLY, December, 1917, page 476, Mr. R. M. Mathews finds the distance formula without making use of the Hesse normal form. Similarly, in this MONTHLY for April, 1918, page 181, Mr. H. T. Burgess comments favorably upon the derivation of Mr. Mathews, gives still another derivation, and states that "Hesse's normal form in this connection may well be relegated to Professor Miller's collection of 'Obsoletes.'"[1]

The book is well supplied with carefully selected exercises graded into "Normal exercises" and "General exercises." On the whole the book is a very teachable class room text which should enable the student to grasp the subject matter and use it successfully in the many well selected problems of the text and in other elementary problems of analytic geometry.

Strange to say, the book has no index. This seems inexcusable in a modern text.

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NOTES.

Simplified navigation for ships and aircraft. A text book based upon the Saint Hilaire method. By C. L. POOR. New York, Century, 1918. 12mo. 18 + 126 pp. + 1 plate ["The line of position computer"]. Price $1.50.

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[1] See also Maxime Bôcher, "Concerning Direction Cosines and Hesse's Normal Form." AMERICAN MATHEMATICAL MONTHLY, September, 1918, pages 308–10.

Contents—Chapter I: Finding one's position at sea and in the air, pp. 3–22; II: Determination of the "D. R." altitude and azimuth, 23–71; III: Corrections to be applied to the measured altitude, 72–88; IV: Simultaneous altitudes, 89–98; V: Notes and practical applications, with special reference to aërial navigation, 99–112; Tables: 113–126.

The *Journal of the Engineers' Club of Philadelphia* for June and July, 1918, contains an article by Carl G. Barth entitled "The income tax: an engineer's analysis with suggestions." The author finds a mathematical formula which agrees closely with the tax imposed by the present law and which would "smooth out" the inequalities in the gradation of this schedule. The formula is compared with Pareto's law of incomes in its estimate of the total national income of the United States; and certain criticisms of the details of the law are made, *e. g.*, that of exemption, on the mathematical basis afforded by the formula.

Four-place logarithmic and trigonometric tables together with interest tables—edited by L. C. KARPINSKI.[1] Ann Arbor, Mich., G. Wahr, 1918. 8vo. 30 pp. Stiff paper, price 30 cents.

Contents—Explanation of tables, pp. 5–7; Constants with their logarithms, 9; Logarithms of numbers, 100–999, 10–11; Logarithms of numbers, 1000–2009, 12–13; Logarithms of sines and cosines, 10′ intervals, 14–15; Logarithms of tangents and cotangents, 10′ intervals, 16–17; Logarithms of sines and tangents by minutes, 0° to 14° (Logarithms of cosines and cotangents by minutes 76° to 90°), 18–19; Numerical values of sines and cosines, 10′ intervals, 20–21; Numerical values of tangents and cotangents, 10′ intervals, 22–23; Squares, cubes, square-roots, cube-roots, and reciprocals, 1 to 100, 24; Degrees and minutes expressed in radians, Values of e^x and e^{-x}, 25; Accumulation of 1 at the end of n years, r^n, 26; The present value of 1 in n years, v^n, 27; The accumulation of an annuity of 1 per annum at the end of n years, 28; The present value of an annuity of 1 per annum for n years, 29; The annual sinking fund to accumulate to 1 at the end of n years, and by addition of i the annuity which 1 will purchase, 30.

The Metric System. A brief explanation, with Exercises and Tables of Equivalents; also a brief discussion of the Centigrade Thermometer and Foreign Money is the title of a pamphlet of sixteen pages (about 10 × 14 cm.), written by Professor J. W. YOUNG, and published last December for the Education Bureau of the National War Work Council of Young Men's Christian Associations by Association Press, 347 Madison Avenue, New York. Thirty-five thousand copies have been distributed already. [The scale of a decimeter on the edge of the outside cover is curiously inaccurate—about a millimeter too long.]

The same press is already at work upon a very short course in algebra and geometry, which is to give just enough of these subjects to enable a man to take up the study of trigonometry. This pamphlet was prepared by Professors YOUNG and MORGAN who are also at work on a very short trigonometry, to be published by the Association Press. It was originally intended that these publications should constitute a basis of instruction in Y. M. C. A. huts at army and navy camps all over the country. The need of something of the kind was everywhere keenly felt.

Amusements in Mathematics by H. E. DUDENEY. London, Edinburgh, and New York, T. Nelson and Sons, 1917. 8vo. 8 + 258 pp. Price 3s. 6d.

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[1] These tables are very similar to those at the end of *Unified Mathematics* by L. C. Karpinski, H. Y. Benedict, and J. W. Calhoun. Boston, Heath, 1918.

Contents—Arithmetical and algebraical problems, pp. 1–27; Geometrical problems, 27–56; Points and lines problems, 56–58; Moving counter problems, 58–68; Unicursal and route problems, 68–76; Combination and group problems, 76–85; Chessboard problems, 85–109; Measuring, weighing, and packing puzzles, 109–111; "Crossing river" problems, 112–114; Problems concerning games, 114–117; "Puzzle games," 117–119; Magic square problems, 119–127; Mazes and how to thread them, 127–137; The paradox party, 137–141; Unclassified problems, 142–148; Solutions, 148–252; Index, 253–258.

This exceedingly interesting volume, packed with descriptions in small type and illustrated by hundreds of wood-cuts, would be a marvel of cheapness even in peace times.

Cours de mécanique professé à l'Ecole Polytechnique. Par L. CORNU. Tome 3. Paris, Gauthier-Villars, 1918. Royal 8vo. 2 + 669 pp.

Contents—Livre X: Résistance des matériaux, pp. 1–170; XI: Hydraulique, 171–310; XII: Thermodynamique, 311–428; XIII: Théorie des machines, 429–634; XIV: Notions d'aviation, 635–654.

Quotation from the "Avertissement": "Ce troisième et dernier Volume traite de la Mécanique appliquée. Les circonstances que nous traversons m'ont déterminé à entrer dans des développements dépassant les limites du Cours actuel de l'Ecole Polytechnique: tout porte à croire, en effet, que, la paix revenue, une transformation profonde s'opérera dans les études scientifiques, qui devront s'adapter plus étroitement aux réalités de la vie, en vue de mieux armer les Français pour la lutte économique succédant aux combats meurtriers . . . Il m'a donc paru qu'il convenait de préparer, en ce qui concerne la Mécanique, cette prochaine évolution."

Mr. William Allingham, who was connected with the marine department of the Meteorological Office of Great Britian for over forty years, died on January 24, 1919 in the sixty-eighth year of his age. He was a prolific writer. With D. W. Barker he was joint author of *Navigation: practical and theoretical* (London, 1896). He also edited the various editions of S. T. S. Lecky's *"Wrinkles" in practical navigation* beginning with the fifteenth in 1908.

On account of war conditions the publication of *Periodico di matematica per l'insegnamento secondario* and *Supplemento al Periodico di matematica* has been temporarily suspended. The last number of *Periodico* was volume 32, no. 6, October, 1917; of *Supplemento,* volume 20, no. 9, July, 1917.

The first number of a new scientific periodical, *El Progreso Cientifico,* has appeared recently at Saragossa under the direction of Professor Z. G. de Galdeano. It is to be a semi-annual review devoted to mathematics, physics, and chemistry, and containing papers dealing with fundamental questions, with criticism, and with scientific methodology, as well as with bibliographies, and matters pertaining to the teaching of science.

Dr. George Sarton, who has been connected with Harvard University and the Carnegie Institution of Washington for several years, expects to return to Belgium in June, but will be again at the Carnegie Institution in December. During his absence he will arrange for the resumption of the publication of *Isis,* the international quarterly (devoted to the history and philosophy of science) which he founded in 1913. The last part of volume 2, which was in the press in Brussels when the war broke out, will probable be issued in the autumn. The publication of volume 3 will take place soon after, perhaps in 1919, but at the latest in the early part of 1920.

Dr. Sarton has also announced in *Science* that "instead of publishing in four languages an effort will be made to use only French and English—chiefly, and perhaps exclusively, the latter. Articles written in other languages will be translated into English. The new *Isis* will only publish shorter articles. The longer and more monographic ones would be included in *Studies in the History and Method of Science* by Dr. Charles Singer of Exeter College, Oxford." The first volume of this work was issued by the Oxford University Press in 1917 and the second volume is now ready for the press. Dr. Singer is to share with Dr. Sarton the editorial responsibilities of the third and succeeding volumes of *Isis*. "Thus *Isis* and the *Studies* would be supplementary one to the other, and between them would provide suitable outlet for new work on the history and philosophy of science."

We list elsewhere a sketch of PETER LUDWIG MEJDELL SYLOW who died September 7, 1918, in the 86th year of his age. He had been professor of mathematics at the University of Christiania since 1898. Seven of his papers published before 1873 are listed in the *Royal Society Catalogue* and yet others in Poggendorff's *Biographisch-Literarisches Handwörterbuch*. Extensive biographical and bibliographical details are to be found in *Norsk Forfatter-Lexikon 1814–1880* of J. B. Halvorsen, volume 5 (Kristiania, 1901, pages 621–623). Sylow was co-editor of Abel's works and a member of the editorial committee of *Acta Mathematica*. A portrait and some biographical notes may be found in *Acta Mathematica 1882–1912. Table générale des tomes 1–35* (Upsala & Stockholm, 1913). The setting of some of his discoveries is indicated by H. F. BLICHFELDT in his *Finite Collineation Groups* (Chicago, 1917).

One of these discoveries is "Sylow's Theorem": "If p^α is the highest power of a prime p which divides the order of a group G, the sub-groups of G of order p^α form a single conjugate set and their number is congruent to unity, mod p."[1] The practical application of this theorem in determining the possible number of Sylow sub-groups of a given group requires considerable numerical computation before even tentative results can be obtained. This led to the publication by the Carnegie Institution of Washington, in 1916, of *A Sylow Factor Table of the First Twelve Thousand Numbers giving the possible number of Sylow sub-groups of a group of given order between the limits of 0 and 12,000*, by HENRY W. STAGER.

ARTICLES IN CURRENT PERIODICALS.

THE ALUMNI REGISTER, University of Pennsylvania, volume 21, no. 2, December, 1918: "Henry Brown Evans, M.E., Ph.D.," by H. P. Fry, 119–121.[2] [Mathematician and astronomer, appointed in 1918 dean of the Towne Scientific School.]

ANNALS OF MATHEMATICS, volume 20 (2), no. 1, September, 1918: "Functions of limited variation and Lebesgue integrals" by Goldie P. Horton, 1–8; "On the Teixeira construction of the unicursal cubic" by N. Altshiller, 9–12; "The functional equation $f[f(x)] = g(x)$" by G. A. Pfeiffer, 13–22; "The existence of the functions of the elliptic cylinder" by Mary F. Curtis, 23–34;

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[1] Sylow, "Théorèmes sur les groupes de substitutions," *Mathematische Annalen*, vol. 5, 1872, pp. 584–594. For the particular statement of the theorem used above Stager refers to Burnside, *The theory of groups of finite order*, 2. ed., Cambridge, 1911, §§ 120 *et seq.*

[2] Unless stated to the contrary such numbers refer to pages.